Hillcrest High School

Grade 9 Mathematics **May 2011**

Time : 2 Hours **Marks : 120**

Instructions

1. This paper consists of **10 questions**. Answer **All** the questions.
2. Calculators may be used, but show all working.
3. Answer all questions along the left hand margin, one below the other.
4. It is in your own interest to write neatly. Rule off after each question.
5. Number the answers exactly as the questions are numbered.
6. If necessary answers should be rounded off to two decimal places.

Question 1

Simplify the following

1.1 $-3m - 4m$ (1)

1.2 $7b - (-2b) + (-5b)$ (1)

1.3 $-6 - 6x + 5 + 12x$ (2)

1.4 $8a^2 + 3a^2 - 6a^2$ (1)

1.5 $-2x^3 \times 4x^2$ (2)

1.6 $(3a^2b)(6ab^3)$ (2)

1.7 $\frac{(21xy^2)(x^3y)}{7x^2y^3}$ (2)

[11]

Question 2

Multiply out and simplify

2.1 $2a(6a + 5b)$ (2)

2.2 $3x^2y(-2xy + 4y^2)$ (2)

[4]

Question 3

Expand and simplify

3.1 $(6t + 5)(5t - 1)$ (3)

3.2 $(2xy - 3)(5xy - 4)$ (3)

3.3 $(a + \frac{2}{a})^2$ (3)

3.4 $(4y - \frac{1}{2})(4y + \frac{1}{2})$ (3)

3.5 $(3x + y)(3x - y) - (2x - y)^2$ (4)

[16]

Question 4

Factorise each of the following

4.1 $12ab - 4b$ (2)

4.2 $3p^2q + 15pq^2 - 12pq$ (3)

4.3 $2x(p + q) - (p + q)$ (2)

4.4 $4p^2 - 25$ (2)

4.5 $1{,}08\,t^4 - 0{,}27t^2$ (3)

[12]

Question 5

Simplify the following

5.1 $\frac{6p^2 - 10p}{2p}$ (2)

5.2 $\frac{14m^2t^3 - 63m^3t^2}{-7m^2t^2}$ (3)

Question 6

Solve the following equations

6.1 $2x - 7 = 15$ (2)

6.2 $3x - 5 = 5x + 13$ (3)

6.3 $2(3x + 4) = 5 - 3(4x - 7)$ (4)

6.4 $\frac{x}{4} - \frac{3x}{8} = 6$ (3)

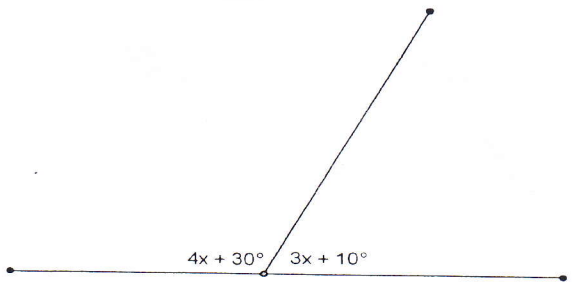
6.5 $\frac{3x-1}{2} - \frac{x-2}{6} = x + 3$ (5)

[17]

Question 7

Calculate the value of x on each of the following. Give reasons.

7.1



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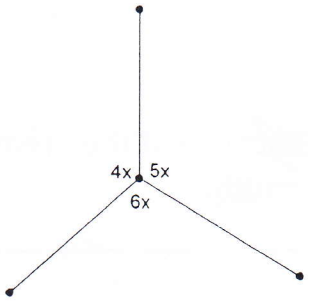
7.2



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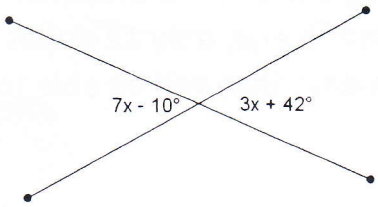
7.3



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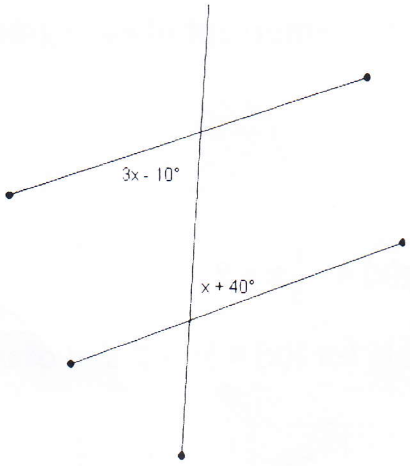
7.4



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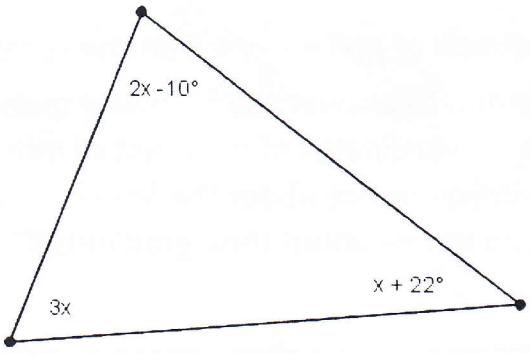
7.5



(4)

[18]

Question 8

8.1 The perimeter of a rectangle is 38cm. Find the breadth and the length if the length is 7cm longer than the breadth. **[6]**

Question 9

9.1 If 5 textbooks cost R675. Calculate the cost of 8 books. (2)

9.2 A group of pupils are planning a trip in the Drakensberg. They buy enough food to last 20 people six days. In the end, only 12 pupils decide to go on the camp. Calculate how many extra days they will be able to camp for, if they camp until the food runs out? (4)

[6]

Question 10

10.1 Find the gradient and the y-intercept of each graph

10.1.1 $y = -5x + 3$ (2)

10.1.2 $y = 2 - \frac{3}{4}x$ (2)

10.1.3 $4x + 2y = -3$ (3)

10.2 Given $f(x) = 3x - 2$ and $g(x) = -\frac{1}{3}x + 3$

10.2.1 Complete the table for $f(x) = 3x - 2$ and draw the graph on the set axes provided.

x	-1	0	1
Y = 3x - 2			

(6)

10.2.2 Draw the graph of $g(x) = -\frac{1}{x}x + 3$ on the same set of axes. (6)

10.2.3 Use your graph to answer the following questions

10.2.3.1 Find the co-ordinates of the point of intersection (2)

10.2.3.2 What do you notice about the lines? (2)

10.2.4 What do you notice about their gradients? (2)

[25]

TOTAL: 120

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Question 10

x	-1	0	1
Y = 3x - 2			

(6)